The role of accounting for managing organizations in an interactive business world

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Introduction

Accounting is closely related to the managing of organizations. This is shown in the introduction chapter in standard text books in cost and management accounting such as Horngren et al, 2009 and Seal et al, 2009. According to these books, accounting information influences the behavior in the organization and it helps the managers to fulfill the organizations objectives. Further, Horngren et al, (2009, p. 29) states that "Managers use accounting information to administer the activities, businesses, or functional areas they oversee and to coordinate those activities, businesses, or functions within the framework of the organization." Some accounting scholars even claim that accounting was a prerequisite for the growth of large multinational companies (Chandler and Daems, 1979; Johnson, 1983). Accounting with methods such as budgets, responsibility accounting and return-on-investment (ROI) formulas made it possible to manage these large companies at a distance.

The classical roles that have been assigned to accounting information are decision making and stewardship control (Danielsson, 1989). The first role is that accounting information is used to support actors when they make decisions about the future courses of action. The accounting information can be used to quantify the financial consequences of different alternatives which can be used by actors when they need to make a certain choice. In this situation accounting information is used to answer problem solving questions (Simon et al, 1954, p. 3): "Of the several ways of doing the job, which is the best?" Thus, accounting information is used to give actors advice on different alternatives.

The second role is that accounting information is used to evaluate if the performance of individuals' or units is satisfactory or unsatisfactory. This put an emphasis on accounting to track realized activities. In this situation accounting information is used to answer score card questions (Simon et al, 1954, p. 3): "Am I doing well or badly?" and attention-directing questions: "What problem should I look into?" Thus, the accounting information is used by the superior to keep the subordinate accountable for his/her actions.

Accounting and its role in managing inter-organizational relationships has received increased attention within the accounting literature (se recent reviews on the topic Caglio and Ditillo, 2008; Håkansson and Lind, 2007; Håkansson et al, 2010a; Kraus and Lind, 2007). One stream of this research has applied the industrial network approach when it theorizes the empirical studies. Some of these studies have mainly focused on the role of accounting for decision making (Alenius et al, 2015, Carlsson-Wall et al, 2009; 2015; Dubois, 2003) and other ones mainly on the use of accounting information for control and evaluation of individuals and units (Baraldi and Strömsten, 2009; Håkansson and Lind, 2004).

This paper will review the literature on accounting that have applied the industrial network approach and relate that literature to the classical roles of accounting – decision making and stewardship control. Further, an empirical study is also used to illustrate the classical roles of accounting in an interactive world. The purpose of this paper is to investigate how an accounting angle can contribute to the development of the industrial network approach.

The remainder of the paper is structured as follows. The next section review the literature on accounting that has applied the industrial network approach. The review is organized around the classical roles of accounting – decision making and stewardship control. Section three consists of a short method paragraph and a description of the empirical setting. Section 4 gives an empirical illustration of the two classical roles of accounting – decision making and stewardship control and the paper ends with conclusions.

Review of the literature on accounting that has applied the industrial network approach

There is a growing body of literature that have studied accounting in inter-organizational relationships and networks and applied the industrial network approach to theorize their empirical findings (Håkansson et al, 2010). Some papers are analytical, however the literature mainly consists of in depth case studies in various industries such as engineering industry, paper and pulp industry, automotive industry, telecommunication industry and retail industry (Agndal and Nilsson, 2009; Alenius et al, 2015; Axelsson et al, 2002; Lind and Strömsten, 2006). Accounting has been viewed differently in the studies. Some of the studies have focused on a particular accounting technique such as open book accounting, target costing, or customer profitability analysis and other studies have applied a rather broad definition of accounting including non-financial information that is non quantitative. The studies have been published in various types of journals and anthologies within the areas of accounting, industrial marketing and purchasing. It is journals such as Industrial Marketing and Management, IMP-Journal, Journal of Business Research, Accounting, Organizations and Society, Accounting and Business Research, Management Accounting Research, and European Journal of Purchasing and Supply Management.

The early part of this literature have been reviewed before (Håkansson and Lind, 2007; Kraus and Lind, 2007; Håkansson et al, 2010). Håkansson et al, (2010) for instance identified three key issues for accounting when it is studied through the industrial network approach. These issues were (1) accounting for indirect effects, (2) accounting for prioritizations and (3) accounting for networking. These issues will certainly occur in this review as well. However, the primary focus of these previous literature reviews has been to identify and elaborate on how the industrial network approach can contribute to the accounting research within inter-organizational relationships. In contrast, the focus on this paper is on how an accounting angle can inform the industrial network approach. Further, an empirical study is also conducted to illustrate the role of accounting within an interactive world. The two classical roles of accounting – decision making and stewardship control is used to organize the literature review.

Accounting for decision making

In his seminal and analytical paper on information needs in alliances and networks Tomkins (2001, p. 162-163) stated that "there seems to be no obvious need to develop new accounting techniques. Rather there is a need for cross-organizational design of management accounting systems." Tomkins emphasized the needs for information sharing between the actors in the companies in order to enable the mastering of events across company boundaries. The accounting information will support the actors with arguments in the ongoing inter-organizational negotiation processes between the involved actors. The relevant accounting information needs to be reflexive, agile and will in itself be a function of the interaction between the involved actors in the relationship. It is important to be able to simulate the effects of decisions on third and fourth partners in the network to evaluate its consequences on the ability to work with these partners and others. Further, the accounting information can help the company to decide on the portfolio of relationships. To find a suitable mix of close and arm's length relationships for the company to meet its objectives. However, it is a complex situation and it is impossible for the accounting information to capture the entire complexity and it needs to be a simplified model of the situation. Thus, accounting and its picture of the interactive world seems to be a tool that actors can use to manage this complex world. It is a tool that guides the actors when they need to choose between possible avenues for the future development of their business.

Accounting information and its involvement in decision making has empirically been studied within different types of business processes. Some examples are evaluation and prioritization of customer relationships, key strategic decisions, purchasing of commodity products and supplier selections, coordination of activities in interconnected supplier relationships and innovation processes from product development to the fuzzy-front end of product innovation (Agndal and Nilsson, 2009; Alenius et al, 2015; Carlsson-Wall et al, 2009; 2015; Carlsson-Wall and Kraus, 2015; Dubois, 2003; Lind and Strömsten, 2006). Thus, the processes range from standardized operations to more complex and non-linear processes. Agndal and Nilsson (2009) found in their

study of accounting in long-term supplier relationships within the Swedish automotive industry that the involved companies used accounting information in the processes that had the greatest impact on the cost of the final product. Accounting information in the form of target costing was used in the early stages of the exchange process. Thus, the most intensive interaction between the involved companies was during the design phases.

Carlsson-Wall et al, (2015) studied how accounting information is used to support strategic decision-making within ABB Robotics. These decisions were made by actors within the firm on multiple organizational levels as well as actors within its key customer GM who made it possible for Robotics to win the large GM contract that had a large impact on Robotics current and future performance. Formal and informal financial and non-financial information influenced the choices that formed Robotics realized strategy. It was detailed information related to the specific key customer. One example was formal internal rate of return (IRR) calculations that show Robotics the necessary cost savings that were needed to achieve in the customer relationship. Further, another example was the purchasers and engineers at the customer who provided Robotics with vital information that made it possible to win the large contract.

Lind and Strömsten (2006) showed that the studied companies applied a mixture of customer profitability analysis methods that varies in relation to the closeness to the specific customer. Customer profitability analysis that evaluated if the customer was profitable on an annual basis was applied in customer relationships that where characterized by high adaptation of the organizational interfaces and low adaptation of the technical interfaces. Thus, the annual customer analysis method was suitable in customer relationships with low amount of investments. Customer relationships that are characterized by high adaptation of the technical interfaces were evaluated by customer accounting techniques with an extended time horizon that capture also indirect costs and benefits generated in other relationships. Hence, the use of life time profitability analysis and customer valuation made it possible for actors to build financial arguments that show that the company should continue with the customer relationship although it seems to be unprofitable when evaluated on an annual basis. The customer profitability framework made it possible for the company to prioritize between customer relationships and give arguments for the possibility to invest more resources in some customers. Further, the customer profitability analysis guided the actors as well when it was necessary to terminate a customer relationship. As such, the customer profitability analysis applied in the studied companies facilitates the managing in an interactive world.

Dubois (2003) studied cost management practices within supplier relationships across company boundaries and show that the introduction of a new costing practice changed the supplier selection processes. The new costing practice extended the calculus object to include the total cost of exchange within the supplier and the buyer. This includes costs for administration of the relationship and other expenses which were caused by the relationship. However, the total cost of exchange for a particular supplier relationship was also linked to indirect effects at other suppliers and customers. Dubois (2003, p. 370) concluded that “total cost of exchange was

extended beyond the boundaries of the two firms, since price had become a matter of the supplier' cost structures, which, in turn, were greatly influence by the preferences and behavior of their other counterparts". The new costing practices made it possible to prioritize and invest resources in some of the supplier relationships and terminate other ones. Thus, the new costing practices guided the actors within the buyer and the key suppliers on how to develop their operations.

A common view in the literature is that accounting information is an obstacle in creative processes such as product innovation (Abernethy and Brown, 1997). However, some of the empirical studies that study accounting and product development with an industrial network approach give another indication. Carlsson-Wall and Kraus (2015) studied how accounting was involved in decision making within the early creative phases of product innovation. Accounting in the form of financial quantifications was not involved in the decision making process within the studied company in the aerospace industry. However, non-financial accounting in the form of a technological maturity staircase (TMS) was used to evaluate the progression of the product innovation. The research and development (R&D) department used the TMS to justify their actions internally to the top management and externally to national funding agencies and other critical counterparts. Further, through the TMS, the R&D department was able to create a coherent story of logical arguments on how the specific technology had developed so far and was going to be developed ahead. With the aid of TMS, the R&D department could mobilize critical actors to support the development of the specific technology. Carlsson-Wall and Kraus (2015, p 8) concluded that "accounting practices have an important role in helping the innovator gather a trustworthy chain of arguments for mobilizing internal and external support and resources. We see a less prominent role of accounting practices in the knowledge exploration process".

The role of accounting within the later phases of the product development was studied by Carlsson et al (2009) in an earlier study. In their study of ABB Robotics they found that the company used the accounting technique "target costing" which influenced many of the choices that were made within the product development. The target costing technique made the development engineers more cost conscious and many technically well-functioning solutions were rejected because they were not within the assigned cost level. Thus, the target costing formed a financial limitation for acceptable solutions. Further, the target costing, with its functional analysis, influenced the search pattern for possible solutions for a problem. The search process for a new solution is primarily limited to solutions within a specific function that do not involve other interfaces within other functions. First when these possibilities have been investigated, the scope is extended to involve other functions. Hence, target costing guided the actors to find viable compromises between technical, organizational and financial demands within the product development.

The large majority of reviewed studies have studied the use of accounting within inter-organizational relationships that consist of products with high complexity. According to Agndal and Nilsson (2009) this is not a surprise. They (2009, p 99) found in their study of supplier

relationships within the automotive industry that "low degree of product complexity and, consequently, lower degree of interaction required in product development, imply that collaboration around interorganizational cost management is less intense, and the suppliers' cost data play a less important role in the exchange process". However, there are studies that show that accounting data can be critical also in relationships that exchange less complex products (Alenius et al, 2015; Dubois, 2003). Dubois (2003) found in her study of purchasing of maintenance repair and operations supplies that the new costing practices had large impact on the processes of purchasing and on the relationship portfolio. The cost data was used to improve the processes and made these more effective and efficient. Instead of improvements and redesigns on the bought products which was the main focus in the above reviewed studies.

Alenius et al (2015) study of open book accounting (OBA) within the retail industry is another example in which accounting information is used to improve the process of bringing cows and pigs to consumer packed goods such as meat cuts and pork loins. The open calculations between the buyer and the supplier influenced the involved companies actions and Alenius et al, (2015, p. 10) stated that "it is the information content of the OBA that supported the involved companies to find temporary solutions". One example of this was when the buyer, through the OBA, realized that the usage of pigs was not good enough and started to search for new solutions together with other actors within the network. Thus, the OBA, with its detailed financial and non-financial information about products and production processes and deviations against expected outcomes for these products and production processes, was a key ingredient when the companies managed the operations. Further, it can be noted that OBA was important when the actors defined the network boundaries. The OBA points out the directions for where the actors explore existing resource interfaces and help the actors identify possible new resource interfaces to exploit.

The various studies of accounting for decision making show that the accounting information is used by a broad range of individuals within the company such as top management, accountants, middle management and key individuals in the interface with counterparts. However, individuals at the key counterparts were also users of the accounting information and involved in the decision making (Carlsson-Wall et al, 2015; Carlsson-Wall and Kraus, 2015). Some studies emphasis the ad hoc uses of accounting information in specific situations (Dubois, 2003; Lind and Strömsten, 2006). Hence, it is necessary to make a thorough investigation to create the accounting information that can guide the actors to make the choices in the specific situation. Other studies have put forward the use of regular accounting information for identifying adaptations and improvements within the operations of the involved firms in the business network (Alenius et al, 2015). Most of the accounting tools identified in the studies span the company boundaries and attempt to capture indirect effects on third parties (Alenius et al, 2015; Carlsson-Wall et al, 2009; 2015; Carlsson-Wall and Kraus, 2015; Dubois, 2003; Lind and Strömsten, 2006; Tomkins, 2001).

A common theme in these studies is that accounting information is used to guide the individuals when they choose between different alternatives. However, more common is that the accounting is used to mobilize various individuals located in different organizational units within the

business network. Thus, accounting is important to mobilize individuals and create action within the business network.

Accounting for stewardship control

Tomkins (2001) did not discuss accounting for stewardship control in his seminal paper. However, he thoroughly discusses the relationship between trust and information which is a common topic within the mainstream inter-organizational accounting literature. A common argument within that literature and in Tomkins[1] paper is that an increased trust between actors can reduce the need for accounting information in the evaluation of the counterparts' performance. Thus, trust can be used instead of accounting for stewardship control within inter-organizational relationships.

Håkansson and Ford (2002) touch upon accounting for stewardship control in their analytical paper on network paradoxes and its implications for management. One of the paradoxes put forward by Håkansson and Ford (2002) is about control and the possibility of being in control within a business network. According to Håkansson and Ford (2002), each company within a network will try to influence the other companies within the network to improve its own positon within the network and the aim for each company is to control its counterparts. However, the paradox is that "the more successful a single company is in forcing its thinking onto the network, the more it and those around it are likely to encounter long-term problems" (p. 137). The managerial implications that are put forward for a company emphasize the importance of the dynamic and interactive nature of business relationships and the danger of acquire complete control of the surrounding network.

Accounting information for stewardship control has empirically been studied within some studies (Baraldi and Strömsten, 2009; Baraldi et al, 2014; Håkansson and Lind, 2004; Lind and Thrane, 2005). These studies have focused on innovation processes within biotech and science industry and product development within the telecom industry. Thus, the focus has been on rather complex and non-linear processes.

Håkansson and Lind (2004) mainly investigate accountability structures within Ericsson and Telia and how these influence the interaction within the focal relationship and the interconnected relationships in the surrounding network. The empirics in that paper will be presented in more detail in the empirical illustration of the role of accounting for stewardship control later on in this

[1] Tomkins (2001) problematized this argument further and argued that the relationship between trust and information need is a u-shaped relationship. Another argument within the accounting literature is that the involved companies need to trust each other before they disclose detailed cost data to each other. This argument is related to when accounting is used for decision making purposes (Baiman and Rajan, 2002; Carr and Ng, 1995).

paper. Baraldi and Strömsten (2009) showed that actors within the network of the scientific innovation used different forms of controls to influence other actors around the innovation. However, it was not possible for a single actor to unilaterally control the innovation process. Thus, it is a situation where a company tries to control other actors simultaneously as these actors tries to control the company. Sometimes the actors have the same goals and they can join forces and influence other actors and in other situations they have conflicting goals. This creates an unstable situation in which the companies suddenly have to change goals and control strategies to be able to find viable compromises that drive the innovation process forward.

Baraldi et al (2014) focus particularly on the commercialization of an innovation and how these are related to different forms of controls and inter-organizational interactions. The authors found a relationship between the control applied in a commercialization mechanism and the specific inter-organizational relationships. A situation with few actors with conflicting interests and intensive interaction is associated with a control based on quantitative methods. However, in a situation with converging goals and intensive interaction the control consists of both quantitative methods and other forms of controls. These finding are in alignment with Baraldi and Strömsten (2009).

There are only a few empirical studies on stewardship control that have applied an industrial network approach. The studies of Baraldi and Strömsten (2009) and Baraldi et al (2014) focuses on stewardship control mainly on the company level and on how different companies tries to control each other. The only study that investigates stewardship control in detail within subunits in companies is Håkansson and Lind (2004). However, the studies by Baraldi and Strömsten (2009) and Baraldi et al (2014) show that accounting in the form of stewardship control creates tension and a need to find compromises between the involved companies to move the innovation forward.

Methods and the setting for the empirical illustration

The empirical setting is the development of a standard software release in the telecom industry. It is a complex development project that continues over a couple of years with many decsions to make. It is influenced by several companies and involves several organizational units within these companies. The focal company within the illustration is Ericsson and its relationship with Telia. The illustration show how accounting in the form of a tool for decision making and stewardship control, influence the development of the standard software release. The empirical illustration is based on an in-depth case study executed in late 1990s. The data collection consists of direct observation, access to intranet and written documents such as organizational charts and economic reports. However, the major source of information is 67 semi-structured interviews that lasted between 1 and 3 hours, with an average duration of 1.5 hour. A more detailed description

of the methodological considerations have been reported before (Håkansson and Lind, 2004; Lind and Thrane, 2005).

The technical structure of the telecom industry and the cellular systems

Ericsson has for a long time been one of the leading companies within the telecom industry. It has since late 1980s been one of the largest cellular system suppliers in the world. A cellular system consists of three major subsystems: switching systems (SS), base station systems (BSS9 and operation support systems (OSS). The BSS are located around the geographic area that constitutes the cellular system. The three subsystems consist of hardware and software. Telecom operators such as Telia Mobile, Vodafone or Orange often have several cellular systems operating at the same time. During 2011 Telia Mobile operates three cellular systems: GSM, 3G and 4G. The company had a similar situation in the late 1990s when it worked with the NMT, GSM and 3G cellular systems. The parallel uses of several cellular systems indicate the long economic life time of a cellular system. The GSM system, which is still used by most of the telecom operators, was introduced in the early 1990s. Hence, the GSM system has been in operation for more than 20 years and, as such, it is critical to continuously update the systems with new content to make it competitive. Further, it is also important for the telecom operators that the different cellular system standards can communicate with each other.

The different cellular systems that are used by the telecom operators differ between each other. Telia Mobile´s GSM cellular system in Sweden has a different configuration compare to Vodafone's GSM cellular system in UK. Thus, the two cellular systems consist of a different combination of hardware and software which means that the two systems will have a different functionality. The cellular system is updated on an annually basis with new software with new functionalities which creates possibilities for the telecom operator to create new end solution services. However, a key issue for Ericsson is to decide which new functionalities the company should develop and offer to its customers in the annual software release.

Ericsson and its customer relationships

The ten largest customers account for a large part of Ericsson's revenue. According to the CFO, the ten largest customer accounts for more than 50% of the company's revenue and most of these customers have had a relationship with Ericsson for a long time period. The customer relationship with Telia has continued in almost one hundred years. This relationship has historically been very important for Ericsson and in the late 1970s the two companies developed the digital AXE-swith together in the joint research company Ellemtel. Other long term customer relationships of Ericsson are Vodafone, Orange AT&T, France Telecom, Deutche Telecom and China Unicom.

The customers have different configurations in their specific cellular systems and as such they have different demand on how Ericsson should prioritize their development resources.

Some customers demand new software that can be used to improve their own operations and, as such, be more cost efficient. Other customers view themselves as the frontrunners when it comes to new advanced technological solutions and they want more sophisticated services for the end users. An example of the conflicting demands from the late 1990s is how differently the customers view the importance of developing the dual band feature. The dual band feature made it possible for the cellular operators to switch between the GSM 900 and the GSM 1800 cellular system. Customers to Ericsson that had reached the maximum capacity utilization within the GSM 900 cellular system had a strong demand for this new functionality. Telia for example early identified this need because their GSM 900 cellular system in Stockholm could not deliver enough capacity to the mobile phone users. However, Mannesmann did not prioritize, the new functionality because the company had not received the license to build the GSM 1800 cellular system in Germany and as such did not need the dual band feature.

The customers and their sometimes conflicting demands on what functionality Ericson should develop are further complicated by the fact that many of the customers had more than one cellular system supplier. Telia Mobile for example had both Ericsson and Nokia as suppliers. Nokia delivered base stations systems to the Gothenburg area and the northern part of Sweden and Ericsson delivered all the switching systems and the base station systems to the other parts of Sweden. This situation put further demands on Telia Mobile and its suppliers. It was necessary for Telia to persuade both Ericsson and Nokia to develop the dual band feature simultaneously to be able to deliver the same services to its customers. Mannesmann on the other hand had Siemens and Ericsson as their cellular system suppliers and Mannesmann had the same need to coordinate these two suppliers as Telia Mobile with Ericsson and Nokia. Ericsson is in that way closely related to its competitors such as Nokia, Siemens and Huawei trough common customers.

A critical issue for Ericsson is which features it should prioritize in the development of new standard software. Some questions that influence this decision are as follows: Which customers are the most important one. Which customers have knowledge about future needs and can be viewed as lead users? Do some customers have close relationships with a critical competitor and, as such, contribute with important information.

The organization of the standard software development

Ericsson organized the standard software development in annual release projects. The customers were in that way annually offered new functionality to their ongoing GSM cellular system. A standard software release consisted of a number of features such as remote loading and dual band. The remote loading feature for example helped the customers to make their operations more efficient by making it possible to change software in the radio base stations at a distance.

The new standard software release was regarded as such a complex project that it was organized within three almost independently managed sub release projects. One project for each sub system: BSS, SS and OSS. The three sub release projects were responsible for the development of hardware and software to its specific part of the cellular system. The number of employees involved in a sub release project was more than 300, located in different development units around the world. The average development time for a standard release project was around three years and it took one further year to implement the release within the customer's ongoing cellular system. The units that were responsible for the different sub cellular system had as a consequence to operate four parallel release projects simultaneously.

To conclude, the standard software release development evolves within a network of embedded relationships that is characterized by technical, organizational and financial interdependences. The buyers and sellers within the telecom industry are intertwined in a complex network of activity links, resource ties, and actor bonds. Different sellers of cellular system are closely connected to each other through common buyers and buyers are closely connected to each other through common suppliers. This complex setting creates a situation were different interests clash which results in tensions, opportunities and contradictions. The development of the standard software release gradually occurs through a series of temporary and pragmatic compromises. The next section of the paper will illustrate the role of accounting as a decision making tool and as a stewardship control tool within this setting.

The role of accounting within the development of the standard software release "R7"

Accounting for decision making

The pre study document

The R7 release was initiated in August 1995 by the strategic product management (SPM) unit within the subsystem BSS. A number of experienced members from the SPM unit had some brainstorming meetings and write a short pre study document in which they drafted the basic framework of the release. The document was just a few pages that describe the key features and the main areas of the release. The project manager of the R7 and other central managers stated that this first draft of the pre study was mainly influenced by the following sources: (1) the long term business plan, (2) pervious release projects, (3) the standard setting body ETSI, (4) customer demands, and (5) the system management unit within the subsystem BSS.

The long term business plan describe Ericsson's preferred position within the telecom network five years ahead and the road map linked to the plan describe how the company should reach that position. The business plan further consists of a long term financial plan with a full profit and loss statement based on growth of mobile phone subscribers, market share and cost figures for the different subsystems. Previous release projects contribute with ideas about features that had been

postponed in previous projects and these were evaluated again. Information from the standard setting body ETSI in which Ericsson and other telecom suppliers and operators were represented was a third source of influence. It was information about decisions on future standards and information on how different companies had acted and argued in the discussions before the decisions. Customer demands was at this early stage informally collected by the SPM unit direct from the customers or through the key account units that were responsible for a specific customer. The final influence comes from the system management unit that gave some input on how the existing system could be improved.

The first drafted short pre study of R7 was given to different evaluation teams. These teams consist of experienced members from the system management unit and the SPM unit. The different teams were responsible for a sub area of the release such as radio network management, operation, maintenance and administration of BSS, transmission management to BSS and radio network performance monitoring. The main task for the evaluation teams was to develop a more precise description of the technical content of the main areas and functions of the release. The teams evaluate if it was technically possible to develop the suggested functions and if they had enough competence and resources to do that. A central aspect was the competence at the different design centres. The design centres was capable to develop certain aspects of a release. Hence, it was not possible to have 50% on network management in one release and 25% in that area in the next release. According to the manager of the system management unit a certain design centre had only competence within a certain area.

The evaluation teams also made a first rough estimation of the costs to develop the suggested functions. The responsibility and competence for these tasks were mainly in the domain for the members from the system management unit. However, the evaluation teams also consists of a few members from the SPM unit that emphases the importance of the customer benefits for the different suggested functions and they are responsible for the estimation of the potential sales for each area and function. With the input from the evaluation teams the SPM unit re-wrote the pre-study document for R7 in the end of 1995. This document was the officially pre study of the R7 release and it did not include any estimations on sales and costs for different areas and functions of the release. However, it described which areas and functions Ericsson view as the most promising to develop in the release. For example did the pre-study emphasis the high speed functionality witch should make it more suitable to transmit data information in the cellular system and a new radio channel algorithm witch allocate radio channels to different mobile phone users.

When the pre-study document was finished it was distributed to a few individuals within some key customers. It was less than five customers that were invited to have these discussions with

the SPM unit. Members from the SPM units visited these key customers and had informal discussions to receive reactions from these key customers on the content of the pre-study. The outcome of these informal meetings with the customers for R7 was that the SPM unit could judge if the outline of the release was on track with customer expectations or if it needed some changes. At this stage the customers seldom emphases specific features. The comments were on a more general level such as which parts of the cellular system Ericsson should put its development resources. One area that received more attentions in R7 at this stage was the cell planning process which ensures that geographical areas were covered and avoid interferences between mobile phone users. According to a large number of interviews within Ericsson was it just a few customers that had the technical knowledge and vision of the future cellular systems to be able to comment on a release project at this early stage of a release. One of these customers was according to the interviews Telia Mobile. Thus, Telia Mobile was one of the customers that had competence and resources to give feedback on the content of the cellular system more than three years ahead.

According to the vice president development in Telia Mobile, this informal meeting was a good opportunity to influence Ericsson in a development direction that was suitable for Telia Mobile. In this early stage of the development project it was in his view possible to change some focus in the project and get attention for their specific need without paying for it. However, it was important to be knowledgeable and the individuals from Ericsson must value the comments because if they do not do that the opportunity will go to individuals representing other customers. Further, if your comments were highly appreciated you could be invited to an exclusive informal research meeting in which the participants meet four times a year. This meeting was organized by the research unit responsible for future generations of cellular system within Ericsson. In that meeting he could influence Ericsson's long term business plan at the SPM unit which was the point of departure in the development of the content in a new release project as well as the content of next cellular system generation.

The release content document

Employees from the SPM unit and the system management unit started to develop and re-write a more precise content of the R7 based on the input from the informal discussion with the selected customers. The SPM unit estimates the commercial benefits of different areas and potential features. Simultaneously the system management unit investigates if the suggested features were possible to develop and if so how much each of them would costs. This interactive process

between the two units within Ericsson continued for a number of months and resulted in market document. This document describes in detail the suggested features that could be developed within the R7 release. A large number of these suggested features were improvements of existing features so called in service performance features. However, the document also consists of a large number of new features. The high speed functionality for example needed several features such as the compression of data and the prioritisation of time channels. Hence, the market presentation document was a comprehensive list of a large number of specified features and the basic ingredients in these features.

When the market document was finished around ten customers were contacted. These customers were considered as the important customers for Ericsson and Telia Mobile was one of these customers. The customers were selected on mainly two foundations: business volume and competence. A customer that had a significant existing business volume or a high expected business volume was a prioritized customer that Ericsson wants to involve in the development process. However, a customer that do not had a significant or expected business volume but was viewed as knowledgeable and was at the development front of the cellular system technology was also prioritized by Ericsson in this stage of the development process. These two categories of customers were contacted by the specific customer unit responsible for that particular customer relationship.

Telia Mobile was approached by the technical specialist at Ericsson's KAM unit Telia Mobile and a senior member from SPM. They presented the market document for employees at the base station systems unit within the development department in Telia Mobile. Simultaneously the technical specialists for the switching system and operation support system present the market document for members from their respective counter unit within Telia Mobile. The different units in Telia Mobile receive the market document for their specific part of the cellular system and analyzed the importance of the different suggested features. When needed the members from Telia Mobile contacted their technical specialists from Ericsson's KAM Telia Mobile unit for more information. In some occasions there were necessary for the technical specialist to involve members from the SPM unit and the system development unit to clarify the issues raised by Telia Mobile.

Telia Mobile return with a written comment on each suggested feature in the market document for respective sub system (BSS, SS and OSS) of the R7. In the written comments Telia Mobile did prioritized between the suggested features and elaborates on its view of the necessity of the different features and their functionality. According to several interviewees from Telia Mobile this prioritisation of different features was a tricky task. This activity with the comments on the

market document makes it possible for them to really emphases the importance of certain features and as such increase the probability that Ericsson develop these features.

It can also be problematic to make it clear that a certain feature was important for Telia Mobile. As the development director in Telia Mobile stated it "if we emphasis some features very much Ericsson will remember that when we should negotiate the price for the features in the release some years ahead". Several interviews argued that it was necessary to take that into consideration when they commented the suggested features. According to the development director at Telia Mobile it was better to influence Ericsson earlier in the development phase of a release. However, sometimes it was necessary to really use the opportunity to make it clear for Ericsson that some specific features was of absolutely highest importance. One such example was when Telia Mobile needed the dual band functionality in the GSM cellular system and had not get the attention for that earlier in the development phases by Ericsson. In that particular case did Telia Mobile not succeed even if the company used all possible ways to influence the SPM and system management units within Ericsson.

According to one senior development engineer in Telia Mobile the most certain way of influence Ericsson and other telecom companies was to join other cellular system operators in the standard setting body and almost force the telecom companies to develop specific functionalities. Several interviews in Telia Mobile stated that this always was a possibility. However, a problem with such a solution was that it also means that they could not use that functionality to increase their competitive advantage. When it comes to the dual band functionality Telia Mobile was not able to mobilize the other cellular system operators to put enough pressure on the telecom companies.

The selection of features in the release

The SPM unit started to prioritized which features that should be developed in the release based on the received comments on the market document from the selected telecom operators. According to the manager of the SPM unit it was mainly two aspects that guided the prioritization of the features: the long term business plan and a commercial business case for each feature. However, he also noted that if they discover a new important feature in the interaction with the customers that could not be developed on commercial grounds but was viewed as of high strategic potential such a feature was also included in the release. The manager of the SPM unit emphasised the importance of always having the business plan in mind when the SPM unit evaluated a specific feature so it was possible to see how it fits with the long term view of the

future cellular system functionality. However, with the business plan in mind each feature was evaluated on its profitability and the most profitable one were prioritized.

The cost part of the commercial business case for a feature was based on time estimations from the system development unit for each feature. It was the most experienced development engineers within the system development unit that makes the first time estimation. These estimations were evaluated by the management team of the system development unit. According to the manager of the traffic design unit do the management team have rule of thumbs when they judge the estimated time for a feature. Another point of reference for that judgement was a database in which it was possible to follow up the used engineering hours for features developed in previous releases. The data was based on the development engineers' activity reports in which they should report how much they have worked and on which feature. This makes it possible to investigate the total development time spent on a specific feature. However, in the view of one subunit manager within the system development unit this data was not always completely reliable.

The revenue part of the commercial business case for a feature was based on how the selected telecom operators had emphasised and commented the different features in the market document. However, the different telecom operators did not receive the same attention from Ericsson. The emphasis a certain customer had given to a specific feature was linked to some other characteristics of the telecom operator. The importance of customer depends on the size of the operator's ongoing cellular system, the number of subscribers and the future growth of subscribers. Other important characteristics were the customer's revenue, cash flow and profitability. A profitable customer with a large ongoing cellular system, a large number of subscribers and a high growth potential receive more attention compare to a customer that was expected to generate less sales volume. However, several of the interviewees from both the development units as well as the customer units within Ericsson stated that it was difficult to decide how honest a customer had been when it commented and prioritised the different features in the market document.

The SPM unit had a point of reference in the Capri information system in which information about all previous offers Ericsson had done to its customers were stored. The information about the offers had a high level of detail and it was possible to identify the price Ericsson had offered for single features and how these were aggregated to the total offer for the release. The offer for a previous release to the customers differs between the customers both regarding price and content. Thus, Ericsson offers a unique setting of features and functionalities for each customer which depends on the software content of the customers' ongoing cellular system. The SPM unit also systematize all the deals and how much each customer had paid for its bought content of the

previous releases in the Capri system. Further, the level of detail in the system was so high so it was possible to track what a customer had paid for each single feature in a specific release. The information about the deals lack some accuracy because it was not an easy task to separate how much a customer had paid for the different features in a release. The account manager market operations elaborated on the accuracy problem and states that when they start the negotiations everything was clear regarding the features and their prices in a release. However, in the end and after a long negotiation the customer bought a release with a large number of features and the payment was a total amount for the entire release. As a consequence, the information in the Capri system based on the judgement of the sales force in the different KAM units.

Accounting for stewardship control

Ericsson and Telia had organized the cellular system operations in mainly three dimensions that effects the stewardship control; technology, relationships, and time. The development of the standard software releases were, as described before, organized in parallel time units and each release project took more than three years to complete. Thus, the units organized in the time dimension were temporary in nature. The units organized in the technological and relational dimension were ongoing units and they supported the time units with the necessary resources.

A technical unit within Ericsson was responsible for the commercial and technical content of a sub part of the cellular system. For example, a specific technical unit was responsible for the development, supply, and support of the hardware and software to the base station system (BSS). Thus, the BSS unit coordinated all global activities that were related to the BSS part of the cellular system. Other technical units were responsible for other parts of the cellular system such as the switching system (SS).

The technical units' commercial responsibilities bring capacity o decide on the content of their specific subsystem. Further, the units were responsible for the profitability of their subsystems. The BSS unit was evaluated on a monthly basis on the consolidated return on sales from the BSS part of the cellular system worldwide. The consolidated return on sales included all revenues generated in the customer units that were connected to the base station systems hardware and software. This means that the revenues generated in the customer units were compiled based on the price given to the end customer by the customer units. Thus, Ericsson did not apply transfer pricing for the exchange between the technical units and the customer units.

The customer units within Ericsson were responsible for a specific customer. Thus, Ericsson had a large number of customer units responsible for customers such as Telia Mobile, Vodafone, Mannesmann, and China Unicom. A customer unit was responsible for all exchanges with the customer and it was always the customer units that negotiated the commercial terms with the customers. The KAM unit responsible for Telia Mobile consisted of more than 50 employees that interacted on a daily basis with employees at Telia Mobile. The KAM unit was responsible for marketing, selling, and delivering all hardware, software, support, and services to Telia Mobile. Further, the unit also acted as Telia Mobiles first contact in development activities and the employees at the unit had competences within the different subsystem of a cellular system. The unit acted as an intermediary between the technical units within Ericsson and elia Mobile. Thus, the KAM Telia Mobile unit coordinated all Ericsson's activities that were related to Telia Mobile.

Market contribution was the key financial measure in the performance evaluation of the KAM unit. The measure captures the revenues from Telia Mobile's operations in the Scandinavian countries and the costs for operating the KAM unit. The prices for the services and the hardware were negotiated between the KAM unit and the relationship unit within Telia Mobile. The technical units provide the KAM unit with a reference price list which the KAM unit needs to be aware of when pricing. The manager of the KAM Telia Mobile unit stated that "if I negotiated a lower price than the reference price for some features and items I will immediate be sacked. However, it is only for a few features and items so there are important to know which there are". Further, several of the managers within the KAM unit had part of their performance based salary connected to activities by Telia Mobile. The manager of the sub unit support would receive a higher salary if Telia Mobile implemented the remote loading feature. Another example was the manager of the sub unit called implementation who had part of his performance salary connected to on time implementation of the release project implementations. It was Telia Mobile who decided when a release was implemented and ready to be incorporated in the ongoing cellular system.

The close connection between the KAM unit and different units within Telia Mobile were shown by the daily contacts that almost all individuals within the KAM unit had with individuals within Telia Mobile. This enabled the KAM unit to receive detailed and trustworthy information about Telia Mobile's future needs. This information was, according to the manager of the KAM unit, necessary in order to be able to persuade the technical units to prioritise Telia Mobile's needs on the functionality of a future cellular system.

Ericsson had systematically created an accountability structure that made technical- and customer units accountable for activities, resources, and issues they could not control. The technical units

were responsible for the consolidated return on sales for their subsystem of the cellular system. However, the interdependences between the subsystems in the cellular system meant that if the BSS unit developed a specific feature, the other technical units had to develop the same feature as well. Thus, the BSS unit is highly dependent on the performance of the other technical units to fulfil its own targets. Further, the BSS unit did not own the customers and did not have any direct contact with them. It was the customer units who negotiated prices and interacted with the customers. Thus, the BSS unit is highly dependent on the performance of the customer units within Ericsson.

The customer units were responsible for the market contribution of their specific customer. The key ingredient for the KAM unit responsible for Telia Mobile to achieve a good performance was the technical features of the hardware and software developed by the technical units. According to all managers within the KAM unit, there was no problem to meet the targets if the technical units developed the cellular system to fulfil Telia Mobile's demand. However, the different customer units had different demands on the future functionality of the cellular system and each KAM unit argued for their specific customer needs. One obvious example was that Telia Mobile urgently needed the dual band feature that could switch between the GSM 900 and the GSM 1800 cellular system. This demand stood in contrast to Mannesmann who did not have the licence to run the GSM 1800 cellular system and did not need the functionality at all. Thus, the KAM unit is highly dependent on the performance of the technical units.

The interdependencies within Ericsson and the company's systematic use of accountability structures that did not align with the organizational structure, created a situation that forced the involved actors to interact with each other. The evaluation of the KAM unit that was responsible for Telia Mobile clearly involved activities and objectives that included its counterpart Telia Mobile. In some situations the KAM unit represent Ericsson in the interaction with Telia Mobile and in other situations it represents Telia Mobile in the interactions with other units within Ericsson.

However, all involved managers accepted this situation with overlapping accountabilities. The manager of the BSS unit stated that "it is unavoidable in a complex organization such as Ericsson". From his point of view in situation it was necessary for him to influence the other units within and outside Ericsson with good arguments to substantiate his requests. A similar view was given by the manager of the KAM unit who also emphased the importance of influencing and persuade them to act in accordance with the KAM units objectives.

Hence, the accountability structure created an unstable situation that forced the involved actors to diffuse and collect non-routinized information from each other. The actors used the information to find new technical solutions. These solutions were temporary compromises that the involved actors could accept for the time being.

Compromises were a necessity to allow the development of the cellular system. To find technical solutions that could fulfil all the different requirements were not possible. The temporary compromises made it possible to handle all problems, conflicts, and contradictions in the business network. Thus, the accountability structure facilitated a process that lead to a continuous search for new temporary solutions.

Discussion and concluding remarks

This paper has investigated how the accounting literature that has applied the industrial network approach can contribute to the understanding of the development of business networks. The review of the accounting literature was organized around the classical roles of accounting – decision making and stewardship control. The literature review and the empirical illustrations show that accounting can contribute to the understanding of the development of the business networks. It is mainly through a more thorough understanding of the dynamics and the path of development in business networks. Accounting and its different roles is closely linked to the processes of stability and instability and to the search processes for solutions of issues in the business network.

Firstly, accounting for decision making creates stability and direction for action. The reviewed studies and the empirical illustration show that accounting information is used to identify and select a specific alternative and mobilize other actors to support this choice. The accounting information makes it possible to create a coherent story of logical argument on why the involved actors should develop in the specific direction.

Secondly, accounting for stewardship control creates instability and a continuous need to find new temporary solutions. The reviewed studies and the empirical illustration show that the accounting information creates tension between the involved actors when they tried to influence each other. The empirical illustration shows that Ericsson had design a responsibility structure that force the units and managers to interact with each other and their counterparts to fulfil their objectives. Thus, it is an unstable situation in which the actors need to find new temporary solutions.

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